ZOAR LEVEE & DIVERSION DAM
Muskingum River Basin, Tuscarawas River, OH

INTRODUCUTION TO
DAM SAFETY MODIFICATION
STUDY PROCESS
&
PUBLIC PARTICIPATION

COL. Robert D. Peterson
Commander,
Huntington District
21 March 2011

US Army Corps of Engineers
BUILDING STRONG®

Agenda

- History of Zoar Levee & Diversion
  Dam
- Study Process
- Public Participation

BUILDING STRONG®

Project Features:

Levee: 3,900 ft. (L) x 45 ft. (H) ; Crest El. 928.5 (min.); Crest Width varies min. 8 ft. to max. 60 ft.

Pump Station: 30,000 gallons per minute (twin 125 hp motors rated at 15,000 gallons per minute capacity each)

Diversion Dam:

440 ft. (L) x 35 ft. (H) Crest El. 934

Diversion Channel:

Invert El. 916

ZOAR LEVEE AND DIVERSION DAM

Zoar Levee & Diversion Dam

- Dam Safety Action Classification (DSAC) I
  - Confirmed by Independent External Peer Review (IEPR) Panel of Experts
- Alert Pool For Levee is Elevation 900
  - Observations and monitoring by field personnel, supplemented with district office personnel
- Levee Can withstand Pool Elevation 909 (90-year event, 1.1% annual chance)
- Dam – no permanent pool recommended
- Emergency Actions if necessary

Zoar Levee & Diversion Dam

- Dam Safety Action Classification (DSAC) I
  - Urgent & Compelling
  - Characteristics – progression toward failure is confirmed to be taking place under normal operations
  - Actions – immediate action to avoid failure, validate classification, implement interim risk reduction measures, and conduct heightened monitoring and evaluation

Zoar Levee & Diversion Dam

- Project History
  - 1936-37 - Constructed Levees (1 & 2) Crest El. 919, Diversion Dam crest El. 934, Diversion Channel invert El. 916
  - 1947 - Dover Pool reaches 902.7, significant underseepage
  - 1948 – Added 14 Relief Wells along landward toe (40 ft. deep on 125 ft. spacing) & 13 Piezometers installed between wells
  - 1950-51 - Raised & Joined levee embankments – Crest El. 928.5 & Constructed Pump Station
  - 1975-2010 - Shallow slides on embankment
  - 1992 - Install new manhole extensions and outlet pipes on existing Relief Wells

Zoar Levee & Diversion Dam

- Project History – continued
  - 1993 Diversion Dam – Installed Upstream Seepage Control, Downstream Seepage Blanket and Collection S

Zoar Levee & Diversion Dam

- Project History – continued
  - 1994-95 - Installed 3 replacement relief wells RW-11, 12, and 13 & added 5 piezometers
  - 1997 - Levee Embankment Reanalysis Report and Diversion Dam Adequacy Analysis Report
  - 2005 - Record High Water Event, El 907.4, Filter Fabric & Sand bag rings for boils

Zoar Levee & Diversion Dam

- Project History – continued
  - 2008 – Installed Emergency Filter Blanket

Zoar Levee & Diversion Dam

- Project History – continued
  - 2008-09 - Rehab Relief Wells, Interior Collection System & Abandonment of Old Relief Wells

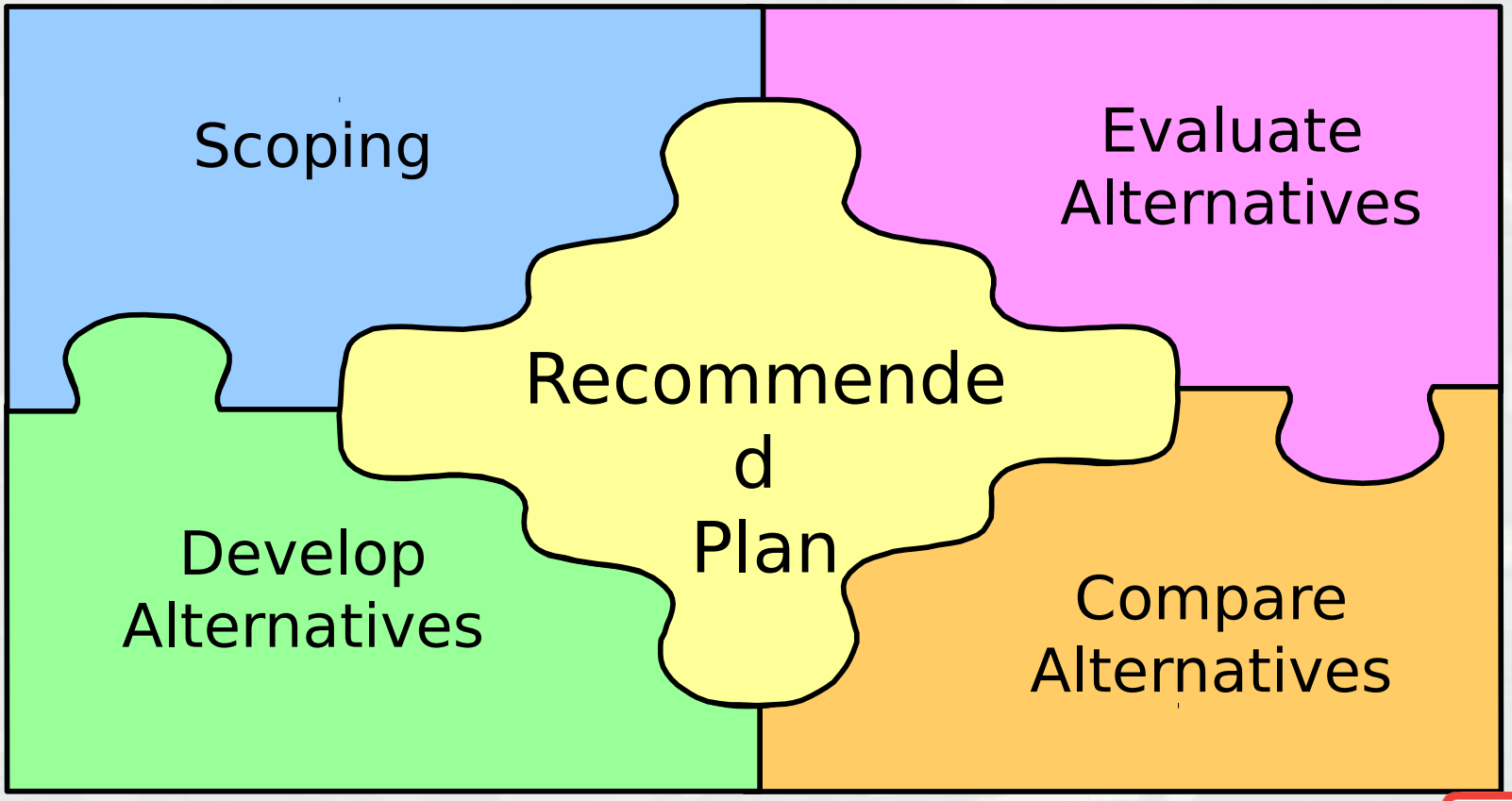
Zoar Levee & Diversion Dam

- Project History – continued
  - 2009-Present – Installing Emergency Generator & 3rd Pump

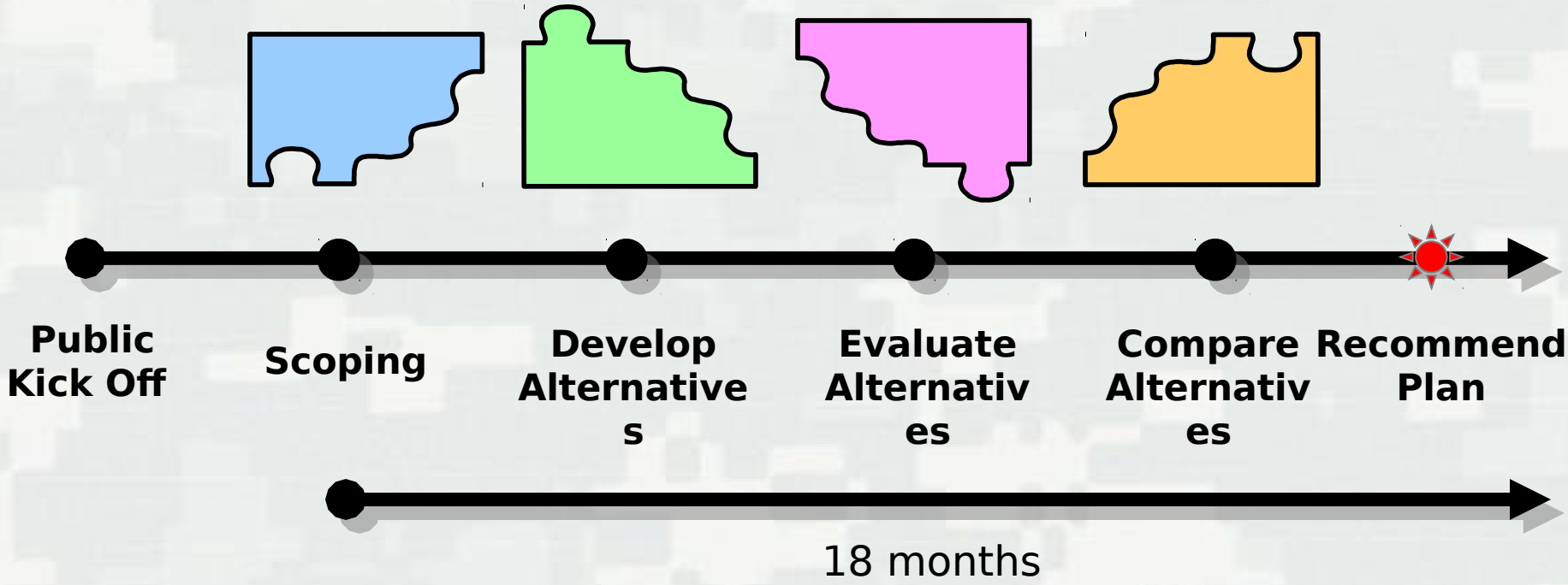
Zoar Levee & Diversion Dam

- Prior Efforts for Major Rehabilitation Report
- Section 2033 of WRDA 2007, Nov. 8, 2007
- ER 1110-2-1156
  - ► Prepare a Dam Safety Modification Report
  - ► Risk Reduction Plan

Civil Works Studies Main Phases



Civil Works Timeline



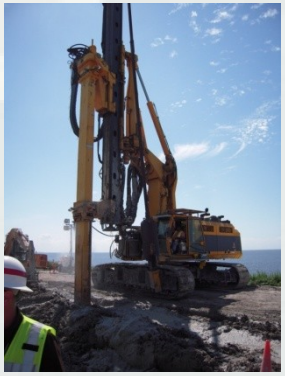
6 Step Study Process

1. Determine Scope of the Study
2. Defining Potential Consequences
3. Identify Alternatives
4. Evaluate Alternatives
5. Compare the Alternatives
6. Identify the Recommended Plan

Types Of Measures

Including but not limited to…

- Structural Measures: Modify The Structure To Reduce Risk
  - Cut-off walls
  - Seepage blankets / berms
  - Relief wells
  - Rehab pumps
  - Relocate / reconstruct dam
  - Abutment grouting
  - Consider replacement of levee and/or dam



- Non-Structural Measures: Modify The Environment To Reduce Risk
  - Acquisition
  - Flood Warning Early Evacuation Plan
  - Flood-proofing
  - Breaching & Abandonment of the Levee And / Or Diversion Dam

Overview Of:

- National Environmental Policy Act (NEPA)

- National Historic Preservation Act (NHPA)

National Environmental Policy Act (NEPA)

- All reasonable alternatives
- Consider impacts to:
  - Social Environment
  - Cultural Environment
  - Natural Environment
- Avoid, minimize, or mitigate impacts

National Historic Preservation Act

- FACT: Zoar Village is listed in the National Register of Historic Places
  - Levee and Diversion Dam also potentially eligible for inclusion on the National Register

Goals

- Avoid, minimize, and/or mitigate adverse effects to historic properties

Public Participation Plan

- .Seek public participation during the study process to help us evaluate alternatives

- .How:
  - A Community Advisory Board
  - Regular public meetings
  - Establish mailing distribution list

Public Participation Plan
Community Advisory Board

- PURPOSE:
  - Unify the voice of the community

- HOW:
  - Fill out the form in your packet
  - Email us at: zoarlevee@usace.army.mil
  - Call us: 304-399-5720

Public Participation
Public Meetings

- PURPOSE: To get input on scoping and the evaluation/comparison of alternatives

- HOW:
  - Participate in the meetings to give ***YOUR*** input and to receive updates to the study process

Public Participation
Mailing Lists

- PURPOSE: Keep public up to date on all activities, meetings, and milestones

- HOW:
  - Fill out the form in your packet
  - Email us at: zoarlevee@usace.army.mil
  - Call 304-399-5720
  - Write us

Path Forward

Our Goals Tonight

- To inform you of the study process and draft Public Participation Plan

- To get your input on our Public Participation Plan
  - Input requested in the next 30 calendar days

In the Future

- Begin with public and agency scoping meetings
- Public Scoping Meeting 24 May

Ways to submit ideas and comments this evening:

- **Talk to A Team Member After The Meeting**
- **Comment Cards in Package**
- **Call us: (304) 399-5720 (Aaron Smith – Study Manager)**
- **Email us: zoarlevee@usace.army.mil**
- **Web site: http://www.lrh.usace.army.mil/projects/review/**
- **Write us: Address in Package**